**BOEM ENVIRONMENTAL STUDIES PROGRAM: Planned New Study**

**Region:** Pacific

**Planning Area(s):** All

**Title:** Potential Impacts of Submarine Power Cables on Crab Harvest (PC-14-02)

**BOEM Information Need(s) to be Addressed:** BOEM requires information concerning the level of impacts from seafloor power cables on marine fisheries. West Coast fishermen have expressed extreme concern over the potential effects of renewable energy power cables on their ability to harvest target species of rock and dungeness crabs. Fishermen are concerned that electromagnetic fields (EMF) associated with renewable energy power cables will present an electrified fence on the seafloor that their resource will not cross. If true, their ability to catch crab species near power cables could be negatively impacted. This study is designed to test the fear of crab fishermen that their target species will not traverse power cables, even in response to baited traps. Combined with the assistance of professional fishermen, submarine transmission cables that electrify communities and offshore oil platforms in the Pacific Region provide an opportunity to test the harvest of crab species across power cables. The information will be applicable to consideration of offshore renewable energy projects.

**Total BOEM Cost:** TBD **Period of Performance:** FY 2014-2017

**Conducting Organization:** TBD

**Principal Investigator:** TBD

**BOEM Contact:** Dr. Ann Scarborough Bull

**Description:**

Background: Renewable energy technologies will focus on the generation of electricity. In all cases, we expect the individual devices will be interconnected with power cables to transmit the electricity to a platform or gathering site, and that a single cable will connect the entire facility to shore. Proper shielding can block electric fields but not magnetic fields. One of the potential impacts from energized power cables may be the local attraction or repulsion of economically important crab species due to EMF. Several commercial crab and lobster species are found in the immediate vicinity of the existing cables within areas where fishermen harvest. These species include rock crab (*Cancer* spp.*)* and dungeness crab (*Metacarcinus magister*). Although there are many factors that control crab response to bait, commercial fishermen successfully harvest, hold, and market crab species on the Pacific Coast. The dungeness crab fishery is the most-valued single-species fishery for Oregon, the highest-valued invertebrate fishery for Washington, and among the top four-valued invertebrate fisheries for California. Rock crab is next in value to dungeness crab for California.

In the Pacific Region, there are at least two adjacent 35 KV cables, several miles long, located within the same corridor on the seafloor within the Santa Ynez Unit offshore Southern California Planning Area that electrify oil platforms. Both of these cables use the industry standards of the power cables that would be used for connecting devices (35 KV) within renewable energy installations. These cables were emplaced concurrently by the manufacturer. These cables provide a unique opportunity to perform a pilot project using commercial rock crab fishermen to test the fear of crab fishers that target species will not traverse power cables in response to baited traps. Market research discussions have been held with Stephanie Munz, president of the Commercial Fishermen of Santa Barbara, who has indicated the project is feasible and of interest. Should the pilot project prove effective, dungeness crab fishers in San Francisco Bay, Puget Sound, and/or Juneau, Alaska, will be approached for involvement. Only locations where power cables and commercial crab fishing overlap will be useful, as will a variety of AC or DC cables at various KV. Knowledge gained from this study will be directly applicable to review of renewable energy projects.

With the assistance of commercial fishermen, we will trap, hold, mark, and release economically important crabs on the opposite side of power cables from baited traps and in a nearby control area with no cables. We will compare catch of crab species to determine catch per unit effort (CPUE) for marked animals at control versus cable areas. Data will directly respond to fishermen's concerns about the target species moving across power cables to be harvested and will inform NEPA assessments of renewable energy projects.

Objectives: The objective of this study is to determine if rock crab and dungeness crab will traverse power cables and be caught in commercial traps.

Methods: Perform power analyses to determine number of crabs, number of traps, and number of trials needed.

*Pilot project for cancer crabs:*

Hire a commercial cancer crab fisher of Santa Barbara
Coordinate with appropriate permitting agencies
Catch, mark, and hold cancer crabs
Place baited traps up current at Santa Ynez Unit power cables and in a control area away from cables
Release crabs down current from power cables and at similar distance from control traps
Maintain traps, monitor, and record catch per fishermen's practice

Analyze the pilot project and revise the experimental approach as necessary. If the pilot project provides necessary data to determine CPUE, determine the location and KV of power cables within dungeness crab commercial fishing areas, and choose at least two locations of variable type and KV.

*Dungeness crab:*

Hire a commercial dungeness crab fisher of the region
Coordinate with appropriate permitting agencies
Catch, mark, and hold dungeness crabs

Place baited traps up current at power cables and in a control area away from cables
Release crabs down current from power cables and at similar distance from control traps
Maintain traps, monitor, and record catch per fishermen's practice

**Current Status:** This study is expected to be awarded through a Cooperative Agreement with a state university or other state entity.

**Final Report Due:** TBD

**Publications Completed:** None at this time.

**Affiliated WWW Sites:** None at this time.

**Revised Date:** September 16, 2013